April 8, 1930. M. J. STASER 1,754,059

LINER PULLER FOR HYDRAULIC PUMPS

Filed Oct. 3, 1928

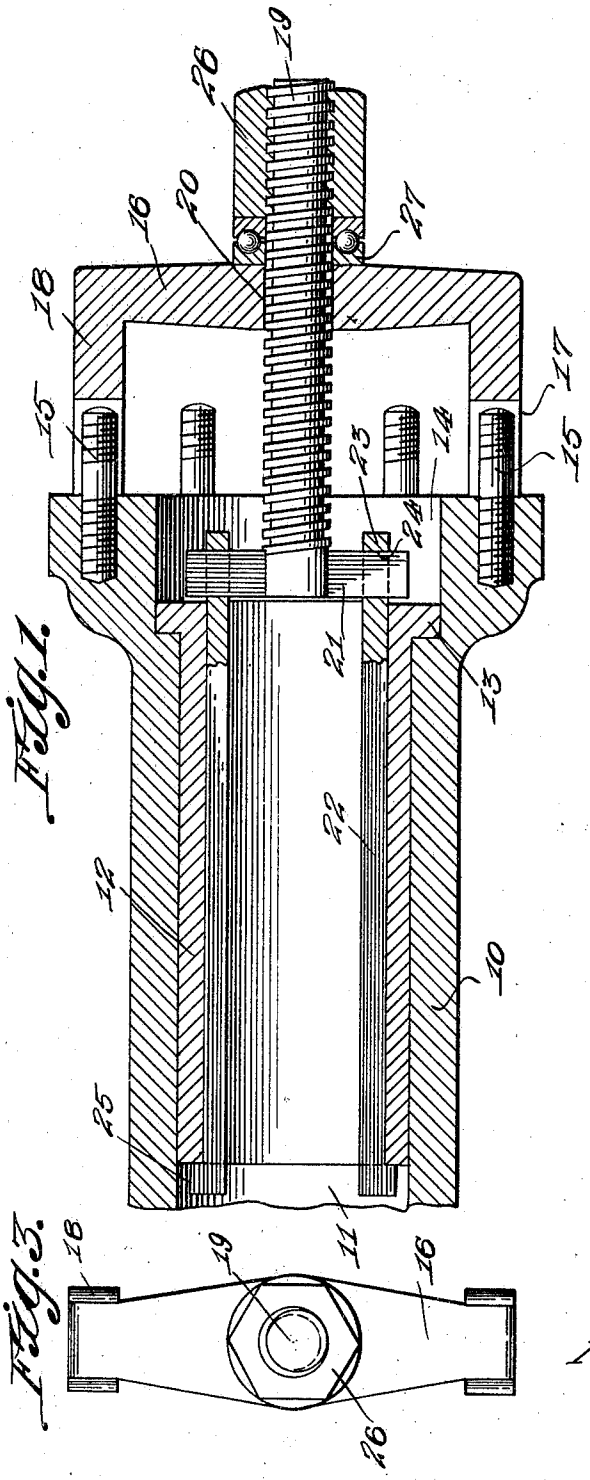

Fig. 1.

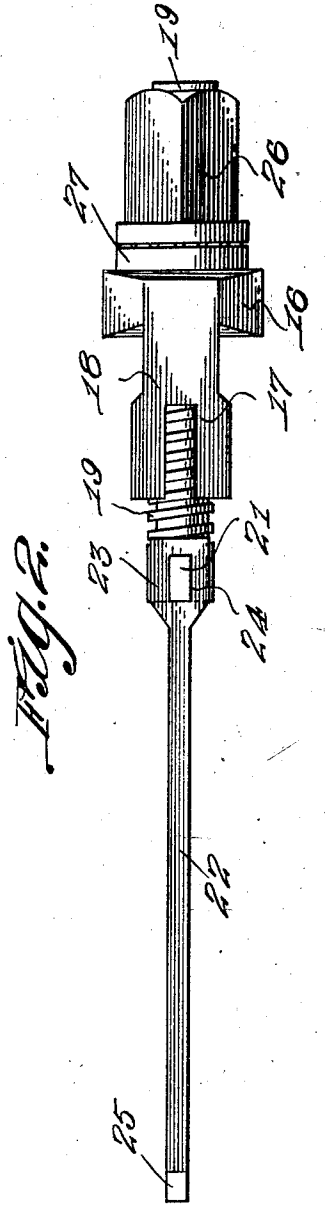

Fig. 2.

Fig. 3.

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LINER PULLER FOR HYDRAULIC PUMPS

Application filed October 3, 1928. Serial No. 310,078.

This invention relates to improvements in pullers primarily adapted for use in the extracting of liners for hydraulic pumps and the like.

An object of the invention comprehends gripping elements adapted to engage the liners within the pump cylinders.

Another object of the invention contemplates a support for the gripping elements and affording adjustment therefor, whereby the same may be employed for use upon liners of different sizes.

An additional object of the invention consists in the provision of an operating mechanism, whereby the gripping elements may be actuated from the outside of the engine.

More specifically stated the operating means is provided with a saddle plate, whereby the device may be operated upon the engine block.

With the above and other objects in view, the invention further consists in the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawing and pointed out in the appended claim.

In the drawing:—

Figure 1 is a fragmentary longitudinal sectional view taken through a pump cylinder and liner therefor illustrating the application of the invention thereon.

Figure 2 is a side elevation of the invention per se.

Figure 3 is a top plan view of the invention.

Referring to the drawing in detail, wherein like characters of reference denote corresponding parts, the reference character 10 indicates a fragmentary portion of a pump having a cylinder 11 and a liner 12 therein. The outermost end of the liner is provided with an annular shoulder 13 adapted for reception within an enlarged counter bore 14 having communication with the cylinder 11.

It is a well known fact that liners used in the liquid ends of hydraulic pumps frequently become so tight in the cylinders that all known pulling methods fail to remove them or become cumbersome in the process of removal and it then becomes necessary to cut them out, though it is obvious that the cut is quite liable to injure the housing of the pump.

To obviate these grave difficulties and to effectively remove the liners, the cylinder heads of the pump cylinders are first removed, not shown, and the stud bolts 15 therefor exposed. The present invention is designed to work from the outside of the cylinder and for this reason a bridge plate 16 of U-shape formation and having portions removed, such as indicated at 17, within the parallel arms 18 therefor are adapted to accommodate the outermost projecting ends of the stud bolts 15 when the extremities of said arms engage the adjacent portions of the pump 10.

A screw threaded shaft 19, preferably having square threads, is passed through an opening 20 in the bridge plate 16.

A cross bar 21, horizontally disposed within the innermost end of the screw threaded shaft 19 disposed within the counter bore 14, is of such length as to permit its insertion within counter bores of different sizes, whereby the particular tool may be termed a universal one.

Liner fingers 22, having enlarged heads 23 upon the outermost ends, are provided with openings 24 therein adapted to accommodate the adjacent ends of the cross bar 21.

Abutments 25, arranged upon the outer sides and adjacent the innermost ends of the fingers 22, are adapted to engage the innermost periphery of the liner 12.

A nut 26, threaded upon the outermost end of the screw threaded shaft 19, is adapted to abut the companion half of a thrust bearing 27 interposed between the inner side thereof and the adjacent portion of the bridge plate 16.

Tightening of the nut 26 upon said shaft will create draft action upon the cross bar 21 and fingers 22 connected therewith, whereby the liner 12 may be effectively removed.

With this particular tool, liners and pistons therefor may be readily removed and replaced to secure various capacities and pressures with the same pump.

Although I have shown, described, and

illustrated the invention as being primarily designed for use in the removal of pump liners, it is obviously understood, that the same could also be most effectively employed in the removing of timing gears and bearing sleeves within the differential housings of motor vehicles.

The invention is susceptible of various changes in its form, proportions and minor details of construction, and the right is herein reserved to make such changes as properly fall within the scope of the appended claim.

Having thus described the invention, what is claimed is:—

A puller for pump liners comprising a bridge plate of U-shape formation having portions removed in the extremities of the legs therefor to accommodate the projecting portions of stud bolts of cylinder heads therefor, a screw threaded shaft passed through an opening in said plate, a nut traveling upon the outermost end of the shaft and engageable with said plate, a cross bar horizontally disposed within the opposite end of said shaft, fingers adapted to be extended within the liners and having sliding adjustable connection at their outermost ends with the extremities of the cross bar, and abutments formed upon the innermost ends of said fingers being adapted to engage the inner peripheries of the liners.

In testimony whereof I affix my signature.

MILEY J. STASER.